

AMENDED CLAIMS

[received by the International Bureau on 29 April 2005 (29.04.05);
original claims 1-4 replaced by new claims 1-8 (7 pages)]

+ statement

1. A method for establishing a plurality of subscriber connections in a
5 digital hybrid subscriber network comprising at least one optical fiber (2), a plurality
of subscriber-specific metallic pair cables (4), and equipment (103) adapting the at
least one optical fiber and the plurality of metallic pair cables to each other so that
the at least one optical fiber goes towards a central site and the plurality of metallic
pair cables goes towards a plurality of subscriber transmission devices (5), whereby
10 (a) each subscriber transmission device is connected to the metallic pair cable of the
respective subscriber at the subscriber end of the metallic pair cable, (b) the central
site is configured to transmit subscriber-specific first information streams in optical
form over the at least one optical fiber (2), and (c) said equipment (103) is
configured to transmit second information streams over the at least one optical fiber
15 (2) to the central site, each second information stream being produced by a respective
subscriber transmission device,
the method comprising the steps of adapting said equipment (103)
- for converting the first information streams received from the at least
one optical fiber into electric form and transmitting each first information stream in
20 electric form over the respective metallic pair cable (4) to the respective subscriber
transmission device (5) and
- for receiving each second information stream in electric format from the
respective metallic pair cable and for converting the received second information
streams into optical form and for transmitting the converted second information
25 streams further over the at least one optical fiber to the central site, and
further comprising the step of
- multiplexing the first and second information streams in optical form
into the at least one optical fiber (2) in respective transmission directions,
characterized by
30 - inserting subscriber-specific conversion elements (105) into said
equipment (103), each conversion element comprising active electronics adapted to
separate each first information stream from other subscribers' first information
streams and to convert each separated first information stream from optical form into

- analog electric form, and further to feed each converted first information stream over the respective metallic pair cable (4) to the respective subscriber transmission device (5), and adapted to convert each second information stream transmitted by the respective subscriber transmission device (5) over the respective metallic pair cable (4) from analog electric form into optical form,
- multiplexing the subscriber-specific first information streams at the central site onto the at least one optical fiber (2) so that (i) the subscriber-specific first information streams can be distributed to each subscriber's conversion element (105) by means of passive optical elements, and so that (ii) the conversion element (105) of each subscriber is able to separate the first information stream intended for the respective subscriber from other subscribers' first information streams,
 - adapting said equipment (103) to distribute the first information streams to the conversion element (105) of each subscriber by means of passive optical elements,
 - adapting said equipment (103) to combine the second information streams of all subscribers and to feed the combined second information streams into the at least one optical fiber (2) by means of passive optical elements,
 - adapting said conversion elements (105) to operate independently so that each conversion element (105) is capable of operating without being dependent on the state of operation of other subscribers' conversion elements, and
 - feeding the operating electric power through the metallic pair cable (4) of each subscriber to the respective user-specific conversion elements contained in said equipment (103).

2. A method according to claim 1, characterized by adapting each subscriber's transmission device (5) to feed direct electric current into the metallic pair cable of the respective subscriber.

3. A method according to claim 1, characterized by inserting a power-generating element (15) into the subscriber-specific conversion element (105) and adapting said power-generating element (15) to produce operating electric power for the conversion element (105) from the direct electric current fed through the metallic pair cable (4).

4. A method according to claim 1, characterized in that each separated first information stream is converted from digital optical form into analog electric form in the respective conversion element (105).

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5. A method according to claim 1, characterized in that each separated first information stream is converted from analog optical form into analog electric form in the respective conversion element (105).

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6. A system for establishing a plurality of subscriber connections, comprising at least one optical fiber (2), a plurality of subscriber-specific metallic pair cables (4), and equipment (103) adapting the at least one optical fiber and the plurality of metallic pair cables to each other so that the at least one optical fiber goes towards a central site and the plurality of metallic pair cables goes towards a plurality of subscriber transmission devices (5), whereby each transmission device is connected to the metallic pair cable (4) of the respective subscriber at the subscriber end of the metallic pair cable, the system further comprising

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- first transmission elements for transporting subscriber-specific first information streams from the central site over the at least one optical fiber (2) to said equipment (103),

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- second transmission elements for transporting second information streams from said equipment (103) over the at least one optical fiber (2) to the central site, each second information stream being produced by a respective subscriber transmission device,

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- means for converting the first information streams received from the at least one optical fiber into electric form and for transmitting each first information stream in electric form over the respective metallic pair cable (4) to the respective subscriber transmission device (5),

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- means for receiving each second information stream in electric form from the respective metallic pair cable, for converting each received second information stream into optical form, and for transmitting each converted second information stream further over the at least one optical fiber to the central site, and

- means for multiplexing the first and second information streams in optical form into the at least one optical fiber (2) in respective transmission directions,

characterized in that

- 5 - said equipment (103) comprises subscriber-specific conversion elements (105) comprising active electronics, which are arranged to separate each first information stream from other subscribers' first information streams, convert each separated first information stream from optical form into an analog electric form, transmit each converted first information stream over the respective metallic
- 10 pair cable (4) to the respective subscriber transmission device (5), and to convert each second information stream transmitted by the respective subscriber transmission device (5) over the respective metallic pair cable (4) from analog electric form into optical form,
- the system further comprises means for multiplexing the first
- 15 information streams at the central site onto the at least one optical fiber (2) so that (i) said subscriber-specific first information streams can be distributed to each subscriber's conversion element (105) by means of passive optical elements and (ii) the conversion element (105) of each subscriber is able to separate the first information stream intended for the respective subscriber from other subscribers'
- 20 first information streams,
- said equipment (103) comprises means for distributing the first information streams to the conversion element (105) of each subscriber by means of passive optical elements,
- said equipment (103) comprises means for combining the second
- 25 information streams of all subscribers and feeding the combined second information streams into the at least one optical fiber (2) by means of passive optical elements,
- said conversion elements (105) are configured to operate independently so that each conversion element (105) is capable of operating without being dependent on the state of operation of other subscribers' conversion elements, and
- 30 - the system comprises power feeding means for feeding operating electric power through the metallic pair cable (4) of each subscriber for the user-specific conversion elements contained in said equipment (103).

7. A method according to claim 6, characterized in that the power feeding means comprise current feeding means in each subscriber transmission device (5), the current feeding means of each subscriber transmission device being configured to feed direct electric current into the respective metallic pair cable (4).

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8. A method according to claim 6, characterized in that a subscriber-specific conversion element (105) contains a power-generating element (15) for producing operating electric power for the respective conversion element (105) from the direct electric current fed through the respective metallic pair cable (4).

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Statement under article 19(1)

Amendments of the claims:

Mostly formal amendments have been made in the claims for more congruent terminology and for avoiding inaccurate expressions. The amendments do not go beyond the disclosure in the international application as filed.

CLAIM 1

Expressions “... *converting the first optical analog or digital information stream ...*” (page 16, line 16), “... *into an analog or digital optical signal ...*” (page 16, lines 21-22), and “... *multiplexing the first and second digital or analog optical information stream ...*” (page 16, lines 25-26) are inexact. Therefore, the two different cases concerning i) the analog optical signal, and ii) the digital optical signal, are separated into two new dependent claims, claim 4 and claim 5.

Other amendments of claim 1 are formal aiming at better legibility and congruent terminology.

CLAIM 2

Dependent claim 2 defines two methods, j) adapting each subscriber's transmission equipment (5) to feed direct electric current into the metallic pair cable of the respective subscriber, and jj) inserting a power-generating element (15) into the subscriber-specific conversion element (105) and adapting said power-generating element (15) to produce the operating electric power for the conversion element (105) from the direct electric current which is fed through the pair cable (4).

Said methods concern the implementation of two separate devices, the RDSLAM and the subscriber's transmission equipment, and there is no direct relation between them. Therefore, dependent claim 2 is divided into two dependent claims, claim 2 comprising case i) and claim 3 comprising case ii).

CLAIM 3

Amendments corresponding the modifications of claim 1 are made in system claim 3 with the exception that no new claims are provided concerning the cases of analog and digital optical signals. Due to the above mentioned new dependent claims, the new number of this claim is 6.

CLAIM 4

Amendments corresponding the modifications of the respective method claim 2 are made in dependent system claim 4 and the claim is divided into two dependent claims, claim 7 and 8.

Impacts on the description and the drawings

References to claim 3 on

- page 1 in line 5 and
- page 4 in line 18

are to be changed to references to claim 6.

There are no impacts on the drawings.